

Remarks

Claims 21-30 are pending upon entry of the foregoing amendments.

Amendments to the Claims

Claims 21 and 28 have been amended to clarify that the at least two flow field paths include a first flow field path having a first length and first molar flow rate and a second flow field path having a second length and a second molar flow rate, that the first flow field path services a first electrochemical surface area and the second flow field path services a second electrochemical surface area, and that *the ratio of the first molar flow rate to the second molar flow rate is equal to the ratio of the first electrochemical surface area to the second electrochemical surface area* such that the electrochemical surface areas of the at least one flow field plate have a current density equal to one another. Support for this amendment is found in the specification at paragraphs [0037]-[0039] (see Patent Application Publication No. 2004/0265675 A1). In particular, support for this amendment is found at least in the specification where there is disclosure that a first molar flow rate may be proportional to a first area and a second molar flow rate may be proportional to a second area, each defined by equation (1).

Claim Rejections Under 35 U.S.C. § 112

Claims 21-30 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing particularly point out and distinctly claim the subject matter which applicant regards as the invention. The rejection is respectfully traversed as applied to the amended claims.

Applicants respectfully submit that the ratio of the first molar flow rate to the second molar flow rate being equal to the ratio of the first electrochemical surface area to the second

electrochemical surface area clearly defines the scope of the claims to a person of ordinary skill in the art. Therefore, the rejection should be withdrawn.

Claim Rejections Under 35 U.S.C. § 102

Claims 21-24, 26 and 28-30 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 5,686,199 to Cavalca et al. (hereinafter “Cavalca”). Claims 21-28 and 30 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 7,067,213 to Boff et al. (hereinafter “Boff”). The rejections are respectfully traversed as applied to the amended claims.

Cavalca

Cavalca teaches that the average path length that reactant gases follows through any of the substantially symmetric flow sectors in a fuel cell is substantially the same. See Col. 8, line 64 to Col. 9, line 1. Thus, Cavalca explicitly teaches flow paths, having the same length and is completely devoid of any teaching or suggestion of flow field paths having different lengths. Contrary to the Examiner’s assertion, Applicants are not asserting that the channels are equivalent to flow paths in Calvaca. Rather, the discussion of the channels prefaces the discussion of flow paths, as reactant gases flow through the channels as they follow their flow paths. Applicants respectfully submit that the description of flow paths of Calvaca was improperly disregarded in the Amendment and Office Action Response filed June 15, 2007, which is restated above.

Furthermore, Cavalca fails to disclose a first flow field path having a first molar flow rate servicing a first electrochemical surface area and a second flow field path having a second molar flow rate servicing a second electrochemical surface area, where *the ratio of the first molar flow*

rate to the second molar flow rate is equal to the ratio of the first electrochemical surface area to the second electrochemical surface area. Applicants' claims thus are novel over Calvaca.

Boff

Boff discloses a flow field having a network of progressively finer channels through which reactant gas flows. Boff, however, is devoid of any disclosure which would enable one of ordinary skill to determine relative lengths of two flow field paths or the molar flow rates relative to an electrochemical areas serviced by flow field paths of the reactant gases as they flow through the described channels. Thus, Boff fails to disclose a first flow field path having a first molar flow rate servicing a first electrochemical surface area and a second flow field path having a second molar flow rate servicing a second electrochemical surface area, where *the ratio of the first molar flow rate to the second molar flow rate is equal to the ratio of the first electrochemical surface area to the second electrochemical surface area*. Thus, Applicant's claims are novel over Boff. The novelty rejections should be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 21-30 were rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,780,536 to Debe et al. (hereinafter “Debe”). The rejection is respectfully traversed as applied to the amended claims.

The U.S. Supreme Court recently stated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” KSR Int'l Co. v. Teleflex Inc., 550 U.S. ____ (Slip Op. at 14). The Court further stated that “it will be necessary ... to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace;

and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an **apparent** reason to combine the known elements **in the fashion claimed...**" Id. The rejection here is based upon reasons that neither are *apparent* nor suggest modifying the elements of Debe in the *precise fashion claimed*.

Debe

Debe discloses a fluid distribution assembly having a flow field device. In one embodiment, a zig-zag flow field has a channel. The pressure drop is proportional to the path length. In addition, Debe teaches of different sizes and shapes of active areas and channels. However, the Office Action has failed to provide any apparent reason to modify Debe in the fashion claimed. A person of ordinary skill in the art trying to achieve a uniform current density across a flow field plate would not have any reason to modify the teachings of Debe to obtain a first flow field path having a first molar flow rate servicing a first electrochemical surface area and a second flow field path having a second molar flow rate servicing a second electrochemical surface area, where *the ratio of the first molar flow rate to the second molar flow rate is equal to the ratio of the first electrochemical surface area to the second electrochemical surface area*. The teachings of Debe are related to the pressure drop being proportional to the path length and broad, general statements related to the fact that any size or shape of active area and/or channel can be used. Therefore, a *prima facie* case of obviousness has not been established.

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AMENDMENT AND RESPONSE
TO OFFICE ACTION

Conclusions

For the foregoing reasons, it is submitted that all of Applicants' claims are novel and non-obvious over the cited prior art. Prompt allowance of each of pending claims 21-30 is therefore respectfully solicited.

Respectfully submitted,



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